EXHIBIT A

SNucleotide. My NCBI [2] (Sign in) (Register) All Databases PubMad Nucleotide Protein Genoma Structure DMIM PMC alconnol BOOKS Search Nucleotide for Go Clear Limits **PreviewIndex** History Clipboard Details Format: GenBank FASTA Graphics More Formats ▼ <u>Download</u> ▼ Save ▼ <u>Links</u> ▼ GenBank: U32664.1 Human adenovirus type 35 pVIII (L4) gene, early region 3 Change Region Shown (E3) genes, and fiber (L5) gene, complete cds Customize View Features Sequence Analyze This Sequence HAU32664 5301 bp DNA linear VRL 13-SEP-1995 Human adenovirus type 35 pVIII (L4) gene, sarly region 3 (E3) U32654 (E5) DEFINITION Run BLAST ACCESSION VERSION KEYWORDS Pick Primers U32884, 1 01:984529 Human adenovirus 35

<u>tuman adenovirus 35</u>

Viruses: dsDNA viruses, no RNA stago; Adenoviridae; Mastadenovirue;

Human adenovirus B; Human adenovirus B2,

1 (bases 1247 to 3224)

Flomenberg, P. R., Chen, M. and Horwitz, M. S.

Sequence and genetic organization of adenovirus type 35 early SOURCE Recent activity ORBANISM Turn Off Clear REFERENCE Human adenovirus type 35 AUTHORS TITLE pVIII (L4) gene, early region region 3 J. Virol. 62 (11), 4431-4437 (1988) JOURNAL <u>U32664</u> (1) 3. YIFOI. B2 (117. 4431-4437 (1990) 3172347 2 (bases 1 to 5301) Basier.C.F.. Flomenberg, P.F., Chen, M. and Horwitz, M.S. Direct Submission PUBMED REFERENCE AUTHORS TITLE » See more... Submitted (28-JUL-1995) Christopher Basior. Microbilegy and Immunology, Albert Einstein College of Medicine, 1300 Morris Park Avonuo, Chanin Bullding, Room 515, Bronx, NY 10461, USA Location/Qualiflers JOURNAL All links from this record **FEATURES** Related sequences // Organiam="Human adanovirus 35" /moj_type="genomic DNA" /strain="Holdon" /db_xref="taxon:<u>10522"</u> /mag="78-91 map units" Full text in PMC Protein PubMed 4. 687 /note="L4: late mRNA family 4: etructural protein" COS PubMed (weighted) /note="L4; late mRNA family 4; etructural protein"
/codon_start=1
/product="pV|||"
/protein_id="AAA75322_1"
/db_xref="GI:984530"
/translation="MSKEIPTPYMWSYOPQMGLAAGASQDYSTRMNWLSAGPSMISRV
NDIRAYRNO!LLEDSALTYTPROHLNPRNWPAALVYGESPAPTTVLLPRDAGAEVQMT
NAGAOLAGGSTLORHRPRHNIKRLWIRGRGIOLNDESVSSPLGLRPDGIFQIAGDGRS
SFTPROAVLTLESSSSOPRSGGIGTVOFVEEFTPSVYFNPFSGSPGHYPDEFIPNFDA
ISESVDGYD"
687. 1004 Taxonomy LinkOut CDS /note="E3: early region 3: Ad2 E3 12.5k homolog" /note- to: early region o: /codon_start=1 /product=12.2 kDa protein" /protoin_ld="AAA75323.1" /db_xref="GI:984531" /transiation="MSGDAAELSRLRHLDHCRRFRCFARELIEFIYFELPKDHPQGPA HGYRITIEGKIDSRLQRIFSQRPVLIERDGGNTTVSIYCICNHPGLHESLCCLWCTEF CDS 958. . 1353 /noto="E3; carly region 3; Ad3 E3 16.0k homolog; possible Ad2 E3 6.7k homolog // Codon_start=1
/produot="15.0 kDa protein"
/protein_id="AAA75324.1"
/db_xref="G|:984532"
/trans|at|on="MkAFAVLCVLSLiKTELRLSYGLPLLOPGFYNOKNKTFPVVODS
VNFTFPTHKLEAGRLHRFSRSIFPTNTTFKTGGELHGLPTENPWVEAGLVVLGILAGG
LV1|LCYLYTPCFTFLVVLWYWFKKWGPY"
993, 998 polyA signal 993..998
/note="L4 polyA signal"
1187..3679
/note="intron exclsed to form E3 mRNA e"
1187..3291
/noto="intron exclsed to form E3 mRNA d"
1187.3008 intron intron 1187. 3008 /note="intron excised to form E3 mRNA c" intron /note= intron excised to form 63 mRNA c⁻
1187. 2418
/note="intron excised to form 63 mRNA b"
1338. 1838
/note="E3; early region 3; class | major
h]stocompat|b|||ty binding protein; Ad2 gp19k homolog" <u>intron</u> CDS

/codon_start=1 /product="18.5 kDa protein" /protein_id="AAA75325.1" /db_xref="G1:984533"

```
/translation="MGPILVLLVLLSLLEPGSANYDPCLDFDPENGTLTFAPDTSRIC
GVL!KCGWECRSVEITHNNKTWNNTLSTTWEPGVPEWYTVSVRGPDGSIRISNNTFIF
SEMCDLANFMSKGYSLWPPSKDNIVTFSIAYCLCACLLTALLCVCIHLLVTTRIKNAN
NKEKMP"
                                                                                                                              1858..2403
/note= E3: early region 3: Ad3 E3 20.1k homolog"
                                      COS
                                                                                                                            /hote- ES, early region 3; Ad3 E3 20.1k homolog"
/codon_start=1
/product="20.3 kDa protein"
/protein_id="AAA75326_1"
/db_xref="G1:984534"
/translation="MASLTSLIFVS!VTAAHGQTVVS!PLGHNYTLIGPP!TSEV!WT
KLGSVDYFD!!CNKTKP!!VTCN!ONLTL!NVSKVYSGYYYGYDRYSSGYRNYLVRVT
QLKTTKMPNMAK!RSDDNSLETFTSPTTPDEKN!PDSM!A!VAAVAVVMAL!!!CMLL
YACRYKKFHPKKQDLLLRLN!"
2421 2984
                                                                                                                          YACRYKKFHPKKQDLLLRLNI"
2421. 2984
/notes"E3; early region 3; Ad3 20,5k homolog"
/noden_start=1
/product="20.6 kDa protein"
/protein_id="AAA75327_1"
/db_xrof="G1:984535"
/transiation="MVSTTTFLMLTSLATLTSARSHLTVTIGSNCTLKGPQGGHVFWW
RIYDNGWFTKPCDQPQRFFCNGRDLTIINVTANDKGFYYGTDYKSSLDYNIIVLPSTT
PPPRTTTFSSSSVANNTISNPTFAALLKRTVNNSTYSHTTISTSTISIIAAVTIGISI
LVFTIITYYACQYRKDKHKGDPLLRFDI"
                                    CDS
                                                                                                                          3026.3301
/note="E3: early region 3; Ad2 E3 10.4k homolog"
/codon_atart=1
/product="10.3 kDa protein"
/protein_id="AAA75328.1"
/db_xref="61:984536"
/translation="Mypphetext| | CAENWOLITIANIA | 
                                 CDS
                                                                                                                           /translation="Myprnffftilicafnycatftavatatpdcigafasyalfafy
TCICVCSIVCLVINFFGLLDWILVRIAYLRHHPEYRNONIAALLRLI"
                                                                                                                          3306., 3710
/note= E3: early region 3: Ad2 E3 14.5k homolog*
                                 CDS
                                                                                                                       /note="E3: early region 3: Ad2 E3 14.5k homolog"
/codon_start=1
/product="15,2 kDa protein"
/protein_[d="AAA75329.1"
/db_xref="d="8A637"
/translation="MOA!LP!FLLLLPYAVSTPAAYSTPPEHLRKCKFQQPWSFLAC
YREKSE!PPNL!M!AG!!N!ICCT!!SFL!YPLFDFGWNAPNAHDHPODPEEH!PPON
WGHP!AL!DYESEPQPPLLPA!SYFNLTGGDD"
3703 4110
                                                                                                                        3703.,4110
/note="E3: early region 3: Ad2 E3 14.7k homolog"
                                CDS
                                                                                                                     /note=E3: early region 3, Au2 Lo 17, A Nombrog
/codon_start=1
/codon_start=1
/product=15.3 kDa protein"
/protein_id="AAA75330.1"
/db_xref="61:984538"
/translation="MTETLITSNSAEDLLDMDGRYSEORLAQLRIRQQQERVAKELRD
VIGIHOCKKGIFCLYKOAKISYEITATDHRLSYELGPOROKFTCMVGINPIVITQOSG
DTKGCiHCSCDSIECTYTLLKTLCGLRDLLPMN"
A108 A111
                                                                                                                     DIKGCHUSCUSIECITILLRILUGERDELERM
4108., 4111
/note="possible E3 polyA signal"
4123., 4128
/note="E3 polyA signal"
4315., 5286
/note="coll surface receptor binding protein: L5: late mRNA family 5"
/coden atert=1
                               polyA_signal
                              Legals Avlog
                              CDS
                                                                                                                   mRNA family 5"
/codon_start=1
/product="floor"
/protoin_id="AAA75331.1"
/db_xref="G1:984539"
/translation="MTKVRLSDSFNPVYPYEDESTSOHPFYNPGF:SPNGFTQSPDG
VtlkCLTPLTTIGGSLOLKVEGGLTVDDTDGTLQEN!RATAP!TKNNHSVELS!GNG
LETQNNKLGAKLGNGLKFNNGD!C!XDS!NTLWTG!NPPNCQ!VENTNTNGGKLTLV
LYKNGGLVNGYVSLVQVSDTVNGNFTOKTAN!DLRLYFDSSGNLLTEESDLK!PLKNK
SYATASETVASKAFMPSTTAYPFNTTTRDSENY!HG!CYYWTSYDRSLFPLN!S!ML,
NSRN!SSNVAYA!QFEWNLNASESPESN!ATLTTSPFFFSY!TEDDN"
5287. 5292
                                                                                                                   5287..5292
/note="L5 polyA signal"
                            polyA signal
                     ORIGIN
```

1601 agtattoto atggottoti agosaggasa acatogramo gitotocati gottatigot 1744 izisogotto cottotiaci kottateti gottatoca discontenti gottatoca cottotici gitosocata concessos goccatano amazanama igottamoc totitotgit tacagnosti 1801 kontessos occatanoca manazanama igottamoc totitotgit tacagnosti 1921 gitotatoca catoggasa tantatamocat totatocato corporagasa casacaggit 1921 gitotatoca catoggasa tantatamocat totatocato corporagasa casacagga agitgatiac titigataca corporagasa catoggasa (gitgatiac titigataca corporagasa) 1931 atotggaco aactgggas gottgatiac titigataca corporagasa tacagaga (gitgatiac titigataca corporagasa) 1931 atotggaco aactgggas gottgatiac titigataca corporagasa (gitgatiac titigataca gonatica (gitogatiac titigataca) 1931 atotggaco aactggasa gottgatiac atotggasa (gitgatiac titigataca gonatica) 1932 atotggaco agagtgatiac daggonama acatocaga titogatiaca (gitogatiaca) 1932 atotggatiaca titigataca gonatica (gitogatiaca) 1932 atotggatiaca (gitogatiaca) 1933 atotggatiaca (gito

Write to the Help Desk

NCB| | NLM | NIH

Department of Health & Human Services

Privacy Statement | Freedom of Information Act | Disclaimer

www.ncbi.nlm.nih.gov/nuccore/984529

//